

## REMARKS

Attached to the Office Action of 5 March 2003 is a signed copy of the form PTO-1449 which the applicants submitted on 16 August 2001. DE 19811900 and DE 19504386 have been crossed out, indicating that they have not been considered. Both of these references are discussed in applicants' specification and applicants have submitted copies of the references. In the interest of furthering prosecution, attached herewith are English language abstracts of DE 19811900 and DE 19504386 (see, English equivalent US 5723038). It is respectfully requested that the Examiner initial the PTO-1449 indicating that the references have been considered.

The specification has been amended to correct obvious minor typographical errors. See, e.g., the titanium alloy discussed in Shirkanzadeh (US 5,205,921).

The subject matter of original process claims 11-20 is being pursued in divisional application Serial No.: 10/372,084 (A PROCESS FOR THE COATING FOR METALLIC IMPLANT). Support for new claims 22 -23 can be found, for example, in original claims 9 and 10. Support for new claims 24 -25 can be found, for example, at page 5 , lines 30-40 of the specification.

### ***Claim Rejections – 35 U.S.C. § 112***

Claim 2 has been rejected under 35 U.S.C. § 112, second paragraph as being indefinite because of the phrase "wherein collagen matrix is layered".

Applicants disagree that one of ordinary skill would find "layered" in the context of claim 2 to be indefinite. In any event , applicants have amended claim 2 to recite that the collagen matrix has one or more layers.

Thus, it is respectfully requested that the rejection under 35 U.S.C. §112, second paragraph, be withdrawn.

***Claim Rejections – 35 U.S.C. § 102***

Applicants' claims 1-3 and 5-7 have been rejected under 35 U.S.C. § 102(a) as being unpatentable over U.S. Patent 4,780,450, to Sauk et al., U.S. Patent 5,573,771, to Geistlich et al. and U.S. Patent 5,543,441, to Rhee et al. Applicants respectfully traverse these rejections.

Sauk discloses compositions containing polycrystalline phosphate ceramic, a phosphophoryn calcium salt and collagen. Sauk does not disclose a process for coating implants. As can be seen at col. 4, lines 50-55, the compositions of Sauk are prepared by simply adding the desired amount of calcium salt as a powder to an aqueous solution containing the desired amount of collagen. The resulting mixture is a tan, hardened sponge which can be implanted into osseous defects directly.

Geistlich teaches a bone product prepared from natural bone. Collagen is absorbed onto the particles of the bone product. Geistlich does not disclose a process for coating implants.

Rhee provides a collagen cross linked with a synthetic hydrophilic polymer to which calcium phosphate particles can be dispersed. Col. 9, lines 8-21 of Rhee discloses that bone repair formulations are prepared by providing compositions of collagen-polymer, or by admixture with a suitable particulate.

The disclosed compositions of Sauk, Geistlich and Rhee relate, however, to mixtures of components. Neither Sauk, Geistlich, nor Rhee teach a collagen matrix mineralized with a calcium phosphate phase. Mineralized collagen matrixes are obtained by precipitating calcium phosphate phase from solution in the presence of collagen. A collagen matrix which is mineralized with calcium phosphate creates definite physical properties (e.g., permeable structure) which are analogous to the bone structure produced *in vivo*, and further exhibits good adhesion directly onto metallic implant surfaces.

Therefore, it is respectfully requested that the rejection under 102 should be withdrawn.

***Claim Rejections – 35 U.S.C. § 103***

Applicants' claims 1-4 , 7-10 and 21 have been rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 5573771 to Geistlich et al., U.S. Patent 5543441 to Rhee et al. and U.S. Patent 5205921 to Shirkanzadeh et al. Applicants respectfully traverse these rejections.

Shirkanzadah teaches an electrochemical deposition of a bioactive calcium phosphate coating. The electrolyte may further contain collagen. At col.3, lines 46-48 of '921 it is pointed out that the micro pores of the calcium phosphate layer encourage adhesion of macro molecules such as collagen. Thus, the collagen component is not mineralized with a calcium phosphate phase.


As noted above, the compositions of Geistlich and Rhee are simply mixtures which may contain calcium phosphate and collagen.

Nowhere in Shirkanzadeh, Geistlich, or Rhee is there any suggestion or teaching of a collagen matrix mineralized with a calcium phosphate phase. Additionally, nowhere in Shirkanzadeh, Geistlich, or Rhee is there a disclosure or suggestion of a process that would arrive at a product of applicant's claimed invention. Therefore, the rejections under section 103 should be withdrawn.

In view of the amendments and above remarks, favorable consideration is courteously requested. However, if there is any remaining issue(s) which can be expeditiously resolved by a telephone conference, the Examiner is courteously requested to telephone the undersigned at the number indicated below.

Respectfully submitted,

  
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